

# Utility Patent Application

## CONFIDENTIAL INFORMATION

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## BATHING AID

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## RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No.  
60/460,662, filed on 04/07/2003.

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## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

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The present invention relates generally to home health care aids and, more particularly, to a bath tub bathing aid comprising a bath chair having an integral mechanism that raises and lowers the chair and a user into a bathtub, thereby aiding in the bathing of physically disabled or handicapped individuals.

2. Description of the Related Art

Persons that have a physical disability, including the elderly and disabled, recognize the difficulties that they encounter while performing tasks that many take for granted. Several activities, such as climbing stairs or bending over from the waist to attend to a shoe, are difficult for the elderly and disabled, and often requires extreme physical exertion to accomplish such tasks. In some instances, these activities are altogether impossible to accomplish without mechanical or personal assistance. One acknowledged activity that is extremely difficult for the elderly and the disabled is entering and exiting a conventional bathtub. For the elderly and disabled, entering and exiting a bathtub is a difficult and dangerous activity, and may result in serious physical injury and or death because the increased risk of slipping on a wet surface, the lack of grasping handles about the tub, the very hard and/or blunt surfaces of the tub and surrounding objects, among other reasons. These difficulties are compounded with those individuals who must be placed in and lifted out of a bath or shower. As a result, many people are forced to either bathe less frequently or they must obtain the assistance of two or more people to help them, which is often embarrassing and/or humiliating for the bathing party.

A search of the prior art did not disclose any patents that read directly on the claims of the instant invention; however, the following references were considered related:

U.S. Patent No. **2,045,110**, issued in the name of *Spiess*, discloses a bathtub appliance that raises and lowers a user into and out of a tub;

U.S. Patent No. **3,106,723**, issued in the name of *Carpenter*, discloses a bath tub seat raised and lowered by a power lift mechanism;

5 U.S. Patent No. **5,072,840**, issued in the name of *Asakawa et al.*, discloses a medical bed apparatus having a body frame, a hoisting assembly and a hammock supported from the hoisting assembly by hanging strings, the strings are used for raising and lowering the hammock via a number of drums above the hammock and assembly;

10 U.S. Patent No. **5,129,112**, issued in the name of *Schaffer*, discloses a bathtub chair lift having a chair coupled to a movable member, the movable member raised and lowered via a motor;

U.S. Patent No. **5,570,482**, issued in the name of *Asakawa*, discloses a device for raising and lowering a hammock or other body support structure onto a  
15 bed or other flat surface;

U.S. Patent No. **5,839,131**, issued in the name of *Schaffer*, discloses a fluid operated chair lift;

U.S. Patent No. **6,003,168**, issued in the name of *Steadman*, discloses an apparatus for moving a person into and out of a bath tub having a seat mounted to a  
20 pivot linkage for raising and lowering the seat;

U.S. Patent No. **6,336,230**, issued in the name of *Lane*, discloses a device for lifting a person into and out of a bathtub;

U.S. Patent No. **6,351,860**, issued in the name of *Schaffer*, discloses a chair lift for raising and lowering a seat into and out of a bathtub; and

5 U.S. Patent No. **Des. 360,024**, issued in the name of *Smith*, discloses an ornamental design for a combination bathtub and seat for handicapped and elderly persons.

Consequently, a need exists for means by which those with physical disabilities can utilize a bathtub easily and in a safe manner while placing less  
10 strain on their care givers.

### SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a bathing aid for the physically impaired.

15 It is a feature of the present invention to provide a bathing aid for raising and lowering the physically impaired into and out of a bath tub.

It is a further feature of the present invention to provide a bathing aid affixed to a bath tub and governed by a control panel for raising and lowering the bathing aid.

20 It is a further feature of the present invention to provide a bathing aid having

a seat or chair that travels along a guide rail via a motor, thereby allowing the user to set in the chair externally to the tub and then actuate transport along the guide rail to within the boundary of the tub.

It is a further feature of the present invention to provide a bathing aid having  
5 a seat or chair that reclines.

Briefly described according to one embodiment of the present invention, a bath tub bathing aid includes a guide rail affixed to the bath tub and projecting beyond the perimeter of the tub substantially perpendicular thereto. The guide rail is affixed to the bath tub via mounting arms. The externally projected portion of the  
10 guide rail includes a leg that supports the guide rail by resting upon a floor surface. A bathing chair or seat is provided that travels along the guide rail as actuated by the control panel and driven by a mechanically coupled motor. A separate elevation motor is mechanically coupled to control raising and lowering the seat or chair, the elevation motor coupled to and directing extension and contraction of a plurality of  
15 cables via a pulley system. The bathing aid is connected to a power source, and may include a power cord and power plug with a ground fault interrupter to prevent electrocution or may be provided by battery supply.

### BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the accompanying drawings, in which like elements are identified with like symbols, and in which:

FIG. 1 is a perspective view of the bath tub bathing aid 10, shown in a ready to utilize state, according to the preferred embodiment of the present invention;

FIG. 2 is a perspective view of the bath tub bathing aid 10, shown in a utilized state according to the preferred embodiment of the present invention; and

FIG. 3 is a side view of the pulley system used to raise and lower the seat surface 50.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

The best mode for carrying out the invention is presented in terms of its preferred embodiment, herein depicted within Figures 1 through 3.

#### 1. Detailed Description of the Figures

Referring first to FIG. 1, a perspective view of the bath tub bathing aid 10, according to the preferred embodiment of the present invention is disclosed in a ready to be utilized state. The bath tub bathing aid 10 is utilized on a conventional

bath tub 15. A guide rail 20 straddles across or traverses the middle of the conventional bath tub 15 and projects outward or beyond the tub 15 in a substantially perpendicular manner. The guide rail 20 is held in place with a series of three mounting arms 25, the mounting arms 25 affixed to the tub via attachment means, such as screws, bolts or other fasteners. Each of the mounting arms 25 has a pair of suction cups 30 to aid in its retention to the surface of the conventional bath tub 15. (Note that only two are shown for sake of illustration). The guide rail 20 comprises an elongated body 22 having a coextensive platform 23, the platform 23 operatively coupled to a plurality of cables 115 for raising and lowering the chair 45. The guide rail 20 also comprises an elongated opening 24 substantially traversing the length of the body 22 and platform 23, the opening 24 receiving and guiding the track glide mechanism 70.

The outward portion or body 22 of the guide rail 20 is held up by a support leg 35 which rests upon a floor surface 40. A bathing seat or chair 45, complete with a seat surface 50, a foot rest 55 downwardly depending from the seat surface 50, a back rest 60 upwardly depending from the seat surface 50, and a pair of arm rests 65 is provided at a conventional elevation and attitude for a common chair. The bathing chair 45 is supported by guide rail 20, with the use of a track glide mechanism 70. A guide track motor 75, with the use of a guide track gearbox 80, propels the bathing chair 45 along the length of the guide rail 20. Power for the

guide track motor 75, along with other components of the bath tub bathing aid 10, is provided from a power cord 85, connected to a ground fault interrupter plug 90. The ground fault interrupter plug 90 is intended to eliminate the risk of electric shock due to the invention's close proximity to water during use. The bathing chair 45 is shown in its outward or non-active use point. It is from this point that the user would access or egress the bathing chair 45 from a normal walking posture on the floor surface 40. An elevation motor 95 (raising and lowering chair 45), in conjunction with an elevation transmission 100, is used to raise and lower the bathing chair 45 into the conventional bath tub 15, and whose function will be described in greater detail herein below. Finally, a control panel 105, provides for the activation and direction of both the guide track motor 75 and chair lowering motor 95. Its location allows ease of access and operation from either end of the guide rail 20, whether the bathing chair 45 is in or out of the conventional bath tub 15.

Referring now to FIG. 2, a perspective view of the bath tub bathing aid 10, is shown in a utilized state. In this view the bathing chair 45 is lowered into the conventional bath tub 15. In said position, the user would be able to bathe. The bathing chair 45 is driven to this position by first activating the guide track motor 75 using the control panel 105. This action produces multiple actions. First, the foot rest 55 is moved to an elevated position, using a series of internal levers and gears. Next, the back rest 60 is reclined to a lowered position. Such a position puts the

user in a reclined position, similar to what would be found sitting in a conventional recliner in a home. At this point the user is transported down the guide rail 20 as defined by a direction arrow 110. When the bathing chair 45 is centered over the conventional bath tub 15, the elevation motor 95 and the elevation transmission 100 are engaged to lower the bathing chair 45 into the bathing position as shown. This is accomplished by the use of four elevation cables 115, of only which three are shown for sake of simplicity. The plurality of elevation cables 115 are controlled via a pulley system 120, as will be described in greater detail herein below within the chair lowering transmission 100. Operation of the elevation motor 95 and the elevation transmission 100 are governed by the control panel 105, which is easily reachable and readily accessible when the bathing chair 45 is deployed inside of the conventional bath tub 15. The user is free to bathe or simply soak when the bathing chair 45 is in its deployed position. When complete, the user operates the conventional bath tub 15 to return the bathing chair 45 to its pre-deployed position, thus allowing the user to simply stand up from a sitting position to complete the bathing process.

Referring finally to FIG. 3, the internal operation of the pulley system 120 is described. The elevation cable 115 begins at a fixed pulley 125 and is routed downward to a first rotating pulley 130 fixed to the seat surface 50. A second rotating pulley 135 is located in a similar manner on the opposite side of the seat

surface 50, through which the elevation cable 115 is routed ant then upward to a  
third rotating pulley 140. Finally, surplus elevation cable 115 is wound upon a take  
up pulley 145. In such a manner, the elevation cable 115, when retracted or  
extended from the take up pulley 145 results in raising or lowering of the seat  
5 surface 50 respectively. This configuration is repeated on the rear of the seat  
surface 50, resulting in a total of four elevation cable 115 that raise and lower the  
seat surface 50 as aforementioned described. FIG. 3 depicts two of said elevation  
cable 115 for purposes of illustration.

It is envisioned that other styles and configurations of the present invention  
10 can be easily incorporated into the teachings of the present invention, and only one  
particular configuration shall be shown and described for purposes of clarity and  
disclosure and not by way of limitation of scope.

## 2. Operation of the Preferred Embodiment

15 The preferred embodiment of the present invention can be used by the  
common operator in a simple and effortless manner, with minimal training. After  
procurement of the bath tub bathing aid 10, it must be installed in a conventional  
bath tub 15, and connected to a suitable source of electrical power with particular  
attention that the ground fault protected afforded by the power cord 85 and the  
20 ground fault interrupter plug 90 is utilized. The guide rail 20 must be secured by the

use of the mounting arms 25 and the suction cups 30. The mounting arms 25 are adjustable in position to accommodate conventional bath tubs 15 of varying styles and sizes. After the support leg 35 is setup upon the floor surface 40, the bath tub bathing aid 10 is ready for use

5           To use the bath tub bathing aid 10, the user prepares for bathing in the conventional manner by disrobing, and filling the conventional bath tub 15 with bath water of the appropriate temperature and quantity. Next, the user sits in the bathing chair 45 utilizing the seat surface 50, the foot rest 55 and the back rest 60. When seated, the user would activate the control panel 105. This will place the user in a  
10           reclined position by raising his or her legs, and reclining the upper torso. When fully reclined, the user is transported down the guide rail 20 and over the conventional bath tub 15. Next, the elevation motor 95 and the elevation transmission 100, lowers the bathing chair 45 and the user into the water. At this point the bathing process can begin. When completed, the user simply activates the control panel  
15           105 to reverse the above process and remove the user from the conventional bath tub 15 with no effort required on the user's behalf. When fully removed, the user simply stands up from a sitting position in the bathing chair 45. At this point the bathing process is complete and the system is in a reset state ready for the next usage.

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the Claims appended hereto and their equivalents. Therefore, the scope of the invention is to be limited only by the following claims.